

Step-up DC-DC converter / white LED driver IC
昇圧型DC-DCコンバータ / 白色LEDドライバIC

TK11840L-G

DESCRIPTION

The TK11840L-G is a step-up DC-DC converter that drives an external NPN power transistor using a constant frequency PWM architecture. The IC works with a wide operating supply range (1.8V to 10V) and has an adjustable output. The IC timing oscillator operating frequency is programmable and can be set up to 1MHz. It also incorporates a soft-start circuit and a short-circuit detection function of a timer-latch type.

TK11840L-GはPWM方式のスイッチングレギュレータコントローラです。動作電源電圧は1.8Vから10Vです。発振周波数は1MHzまで調節可能です。ソフトスタート機能・タイマーラッチ式短絡検出機能を内蔵しております。

FEATURES

- Operation from 1.8V to 10.0V supply
- Adjustable output voltage
- High speed adjustable OSC: up to 1MHz
- Incorporates a soft start circuit
- Incorporates a short circuit detection of a timer-latch
- Totem-pole type output in which drive current is adjustable using an switching resistor: pin 4
- 1μA or less shutdown current
- Small package: SOT23L-8
- 低動作最低電源電圧: $V_{OP}=1.8\sim10.0V$
- 出力電圧調整可能
- 高速動作が可能: 最大1MHz
- ソフトスタート回路内蔵
- タイマーラッチ式短絡検出回路内蔵
- 出力はトータムポール形式でスイッチングTr.ドライブ電流調整可能 (NPNスイッチングトランジスタ対応)
- 1μA以下のシャットダウン電流
- 小型パッケージ: SOT23L-8

APPLICATIONS

- The White LED Driving Systems: 2 to 48 or more
For Back-lighting and Front-lighting, Flashlights etc.
Mobile Communication Systems:
Cellular Phone, PHS, DSC, PDA,
Computer Peripheral Equipment
Battery & Dry Cell Battery Systems
Portable Equipment
- Step-up DC-DC Converter (Voltage Supply)
Camera, Radio, Communications Equipment etc
- VCD Bias
- 白色LED駆動システム:
バックライト, フロントライト, フラッシュライトなど
モバイル通信機器:
携帯電話、PHS、DSC、PDA、
コンピュータ周辺機器
バッテリー駆動機器
携帯機器
- 昇圧型DC-DCコンバータ
カメラ、ラジオ、その他通信機
- VCDバイアス

PACKAGE OUTLINE

ORDERING INFORMATION

Part name	Package	Marking	Pin configuration	Ordering information												
TK11840L-G	 SOT23L-8	D40	See next page	<table><tr><td>T</td><td>K</td><td>1</td><td>1</td><td>8</td><td>4</td><td>0</td><td>L</td><td>T</td><td>L</td><td>-</td><td>G</td></tr></table> Package code L: SOT23L-8 Environment code G: Lead free Storage direction TL: Left type	T	K	1	1	8	4	0	L	T	L	-	G
T	K	1	1	8	4	0	L	T	L	-	G					

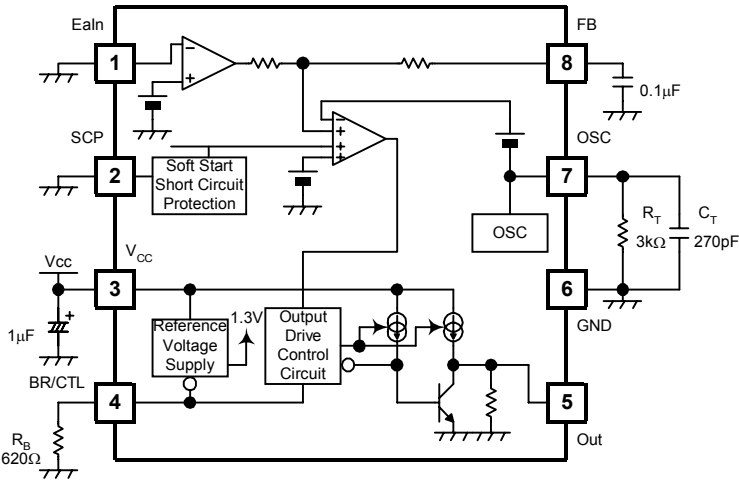
ABSOLUTE MAXIMUM RATINGS

Parameter	項目	Symbol	記号	Rating	定格	Unit	単位	Remarks	備考
Operating Voltage Range	動作電圧範囲	V_{OP}		1.8 to 10.0		V			
Operating Temperature Range	動作温度範囲	T_{OP}		-20 to +85		°C			
Power Dissipation	許容消費電力	P_D		400		mW			
Operating Frequency Range	動作周波数範囲	f_{OP}		to 1		MHz			

ELECTRICAL CHARCTERISTICS

Parameter 項目	Symbol 記号	Value			Units 単位	Conditions 条件
		MIN	TYP	MAX		
Switch Maximum Voltage スイッチ最大電圧	$V_{SW, max}$	Depending on external Tr.				
Switch Maximum Current スイッチ最大電流	$I_{SW, peak}$	Depending on external Tr.				
Switch Maximum Base Current スイッチ最大ベース電流	$I_{Out, max}$			50	mA	Adjustable by R_B
Maximum Duty Ratio 最大デューティ比	D_{MAX}	65	75	85	%	
Error Amplifier Reference Voltage エラーアンプ基準電圧	V_{EA}	0.48	0.50	0.52	V	
Quiescent Current 静止動作電流	$I_{IN, ON}$		5.0	9.0	mA	
Shutdown Supply Current シャットダウン電源電流	$I_{IN, OFF}$		0.1	1	uA	

BLOCK DIAGRAM



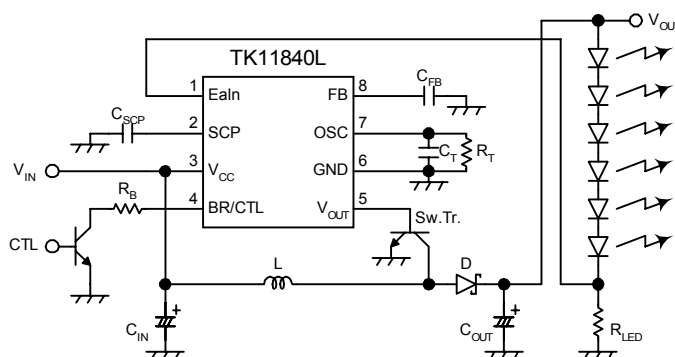
6 WHITE LED DRIVER APPLICATION WITH ON/OFF CONTROL

■ Designed Performance

Input Voltage	$V_{IN}=2.5$ to $10.0V$
LED Current	$I_{LED}=20mA$
Oscillation Frequency	$260kHz$
Inductor Peak Current	$560mA$
Coil (TOKO)	Type D52LC A914BYW-100M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	10	μH
Input Capacitor	C_{IN}	4.7	μF
Output Capacitor	C_{OUT}	2.2	μF
Short Circuit Protection Resistor	C_{SCP}	0.1	μF
Bias Resistor	R_B	2	$k\Omega$
Time Capacitor	C_T	270	pF
Time Resistor	R_T	6.8	$k\Omega$
Feedback Capacitor	C_{FB}	0.1	μF



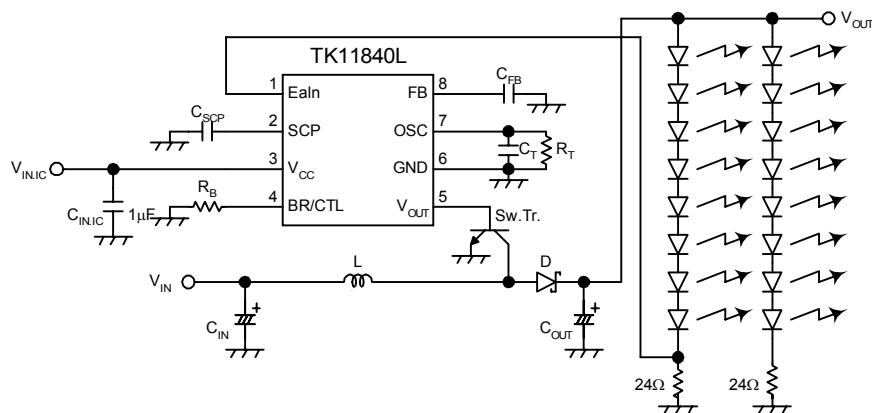
16 WHITE LED DRIVER APPLICATION

■ Designed Performance

Input Voltage	$V_{IN}=12\pm 1V$
LED Current	$I_{LED}=20mA+20mA$
Oscillation Frequency	$440kHz$
Inductor Peak Current	$300mA$
Coil (TOKO)	Type D52LC A914BYW-470M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	47	μH
Input Capacitor	C_{IN}	4.7	μF
Output Capacitor	C_{OUT}	10	μF
Short Circuit Protection Resistor	C_{SCP}	0.1	μF
Bias Resistor	R_B	2	$k\Omega$
Time Capacitor	C_T	1000	pF
Time Resistor	R_T	1	$k\Omega$
Feedback Capacitor	C_{FB}	0.1	μF



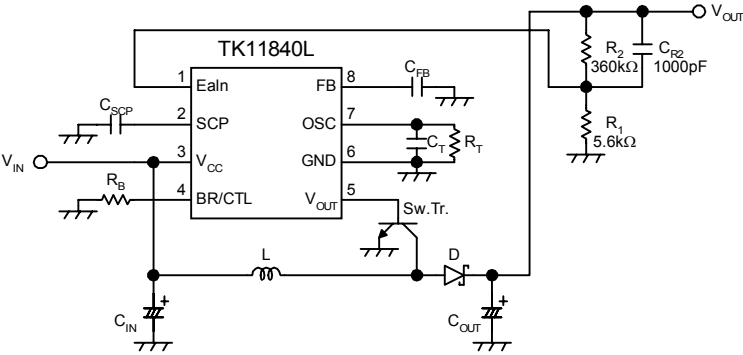
V_{OUT}=32V STEP-UP DC-DC CONVERTER FOR LDC/VCD BIAS APPLICATION

■ Designed Performance

Input Voltage	V _{IN} =4.5 to 5.5V
Output Current	I _{OUT} =up to 10mA
Output Voltage	V _{OUT} =32V
Oscillation Frequency	110kHz
Inductor Peak Current	250mA
Coil (TOKO)	Type D52LC A914BYW-101M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	100	μH
Input Capacitor	C _{IN}	4.7	μF
Output Capacitor	C _{OUT}	10	μF
Short Circuit Protection Resistor	C _{SCP}	0.1	μF
Bias Resistor	R _B	2	kΩ
Time Capacitor	C _T	1000	pF
Time Resistor	R _T	4.7	kΩ
Feedback Capacitor	C _{FB}	0.1	μF



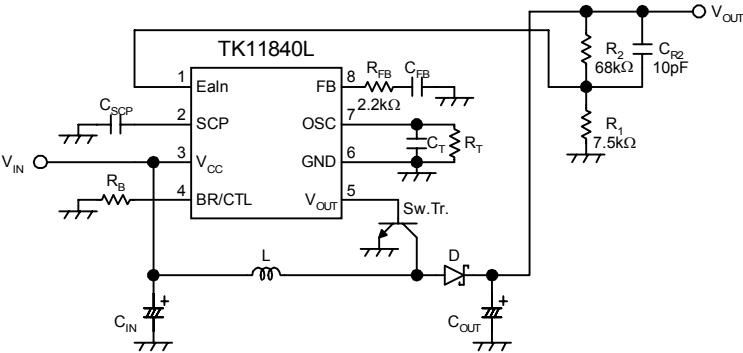
V_{OUT}=5V STEP-UP DC-DC CONVERTER FOR SPEAKER DRIVER APPLICATION

■ Designed Performance

Input Voltage	V _{IN} =3.0 to 4.0V
Output Current	I _{OUT} =up to 300mA
Output Voltage	V _{OUT} =5.0V
Oscillation Frequency	740kHz
Inductor Peak Current	800mA
Coil (TOKO)	Type D412F 972AS-4R7M

■ List of common components

Parameter	Symbol	Value	Unit
Coil	L	4.7	μH
Input Capacitor	C _{IN}	4.7	μF
Output Capacitor	C _{OUT}	22	μF
Short Circuit Protection Resistor	C _{SCP}	0.1	μF
Bias Resistor	R _B	1	kΩ
Time Capacitor	C _T	270	pF
Time Resistor	R _T	2.2	kΩ
Feedback Capacitor	C _{FB}	0.1	μF



* Please inquire us about applications except above.
上記以外のアプリケーションについてはお問い合わせ下さい。